views of Tyndall and Helmholtz as to the important part played by liquefaction of the ice under pressure and regelation, with all that follows from this law, have also received important corroboration.

(2) All that Dr. Nansen has recorded of the snow-covered "inland-ice," goes to show how important a factor a loose covering of snow is in dispersing the solar rays, and so preventing the transmission of a large part of the *luminous* energy into the ice, where, on the "greenhouse principle" (see NATURE, vol. xxvii. p. 554) it would otherwise be converted into dark heat by absorption, and so facilitate the "flow" of the ice.

(3) The interpretation of the observed facts of the Waigatz Sound (about 71° N. lat.), quoted by Dr. Nansen from Prof. Helland, must be received with some caution. It is based largely on the assumption that the basalt capping of the district referred to was once a *continuous sheet*, whereas it is just as likely that the portions of the basalt cap now observed may be only originally separate tongues of the lava-flow, and that the soft Tertiary strata have been worn out by the action of frost and running water as an ordinary "fjord." Erosive action of glacier-ice seems here unnecessarily invoked. Even supposing these strata to be of an age so late as the Miocene, there is a wide berth in *time* for the action of running water, aided and supplemented by the disintegrating action of frost, which Dr. Nansen's own record shows, in the present condition of things, to be (in the interior) often some degrees below the freezing-point of mercury in such latitudes. Then, again, there is the important consideration, which Dr. Nansen touches upon but slightly, that the Miocene period of Greenland may not have synchronized with that period in more southern latitudes. The *relative* value of the different periods of the Tertiary age, as affected by latitude, is a matter, which, so far as I know, has not received from geologists anything like that consideration to which it is entitled, though the reason may not be far to seek.

(4) The extension of the lower parts of the ice-sheet into the valleys to form glaciers has, I think, been over-estimated as an agent of *erosion*, insufficient account having been taken of the expenditure of mechanical force in the shearing of the ice. This argument has been more fully worked out by myself in my paper on the "Mechanics of Glaciers" (*Q.J.G.S.*, vol. xxxix. pp. 64, 65).

(5) The summary manner in which the formation of "*åsar*" is dealt with (*op. cit.*, p. 494) seems to be based upon the assumption that they were formed beneath the ice-sheet; but this can scarcely be said to be established. Against the results arrived at by Dr. N. O. Holst, of Stockholm, from an extended investigation of these phenomena in Sweden, the non-observance of surface-rivers on the Greenland ice-sheet, rather late in the season of the year, by Nansen's party, can scarcely be said to militate very strongly, seeing that such rivers were observed by Nordenskiöld. The *åsar* are best known in formerly glaciated regions of more southern latitudes, successive zones of which would constitute the *marginal* areas of the ancient ice-sheet during its gradual diminution and the retreat of the ice from lower to higher altitudes; while a different configuration of the country would furnish the necessary moraine material, which would appear, from Dr. Nansen's observations, to be almost wanting in Greenland, though Dr. Holst saw a good deal in the summer of 1880 (see the *American Naturalist* for August 1888, p. 707).

A. IRVING.

NOTES.

LAST week men of science and the general public were sincerely sorry to receive bad reports as to the state of Prof. Tyndall's health. On Wednesday there was a severe crisis in his illness, but afterwards hopeful symptoms manifested themselves, and these, we are glad to say, have since been maintained.

THE vacancy in the position of Director of the Royal Meteorological Institute of the Netherlands, caused by the death of Prof. Buys-Ballot last year, has been filled up by the appointment of Dr. Maurice Snellen, who has for many years been connected with the Institute. Dr. Snellen represented Holland at the Meteorological Congress of Rome in 1879. He was the chief of the Dutch Expedition to Dickson Harbour in 1882, to take part in Weyprecht's scheme. It will be remembered that the Expedition was caught in the ice, and eventually had to abandon the ship and return without ever reaching its destination.

THE forthcoming International Ornithological Congress at Budapest is expected to be a great success. It will be held from May 17 to 20. There will be various interesting exhibitions, and the following lectures will be delivered:—On the life of West African birds, by Alexander Homeyer, of Greifswald; on the results of observations upon the passage of birds, by Otto Herman; on the life of birds in Arctic Norway, by Robert Collett, of Christiania; and on the life of Alpine birds, by Victor zu Tschudi Schmidthoffen. After the close of the proceedings expeditions will be made to various parts of Hungary.

THE Medical Faculty of Queen's College, Birmingham, with the contents of the museums and other property belonging to it, is to be transferred to Mason's College, where for some time a part of its work has been carried on. This has been formally decided by the Council of Queen's College, whose action has been ratified by the governors of the institution. The decision is an important one, and may prove to be the first step towards the establishment of a University for the Midlands. During the last few years there has been a great increase of medical students, and this has rendered the present accommodation much too small, whilst the Queen's College authorities have no funds available which would permit them to carry out the necessary reconstruction. Moreover, it is felt that the systematic part of medical education should be carried out under the control of one Board, and not as at present under the direction of two independent Councils. New buildings, adjoining those of the Mason College, and connected with them, but having also an independent entrance, will be erected for the School of Medicine, and in the plans due provision will be made for the largely-increased number of students whom it is expected the more perfect equipment and enlarged facilities of the new school will attract.

THE Council of the Society of Arts, acting under the provisions of the Benjamin Shaw Trust, have offered two gold medals, or two prizes of £20 each, to the executive committee of the Congress of Hygiene and Demography, for any inventions or discoveries of date subsequent to 1885, exhibited at or submitted to the Congress, and coming within the terms of the Trust. Under the conditions laid down by the donor, these prizes are to be offered for new methods of obviating or diminishing risks incidental to industrial occupations.

STEPS are being taken in Paris to prepare the way for the holding of an International Colonial Exhibition next year on the Champ de Mars. According to the Paris correspondent of the *Times*, the sections would be geographical, not political, all the West Indies, for instance, forming one section, all India another, and so on. Specimens of all the native populations would be brought over and housed as at their homes, and two Congresses—a Colonial and an Ethnographical—would be held.

AN International Agricultural Congress will be held at the Hague in September next, from the 7th to the 12th. A Commission will be appointed at the Hague to arrange for the reception of the members.

We regret to have to record the death of Mr. Tuffen West, on March 19, at his residence, Furnell House, Frensham, in his sixty-eighth year, after a very painful illness. Having lived in great seclusion for many years, owing to infirmities of various kinds, Mr. West was but little known to the present generation of naturalists. Twenty or thirty years ago, a descriptive work on natural history was scarcely considered complete unless illustrated by him; and scientific magazines and the publications of the learned Societies bear testimony alike to the marvellous accuracy of his pencil and to the artistic feeling which characterized all his productions.

The law transferring the U.S. National Weather Service from the War Department to the Agricultural Department will take effect on July 1. The *New York Tribune*, commenting on this change, says that Congress, in directing it, was probably "governed by the obvious fact that meteorological work is essentially civilian, and not military, in character." The *Tribune* urges that great care should be taken in the selection of a new chief. "Congress," it says, "has properly provided that the daring and skilful commander of the Fort Conger Arctic Expedition of 1881-84 shall, after the Signal Corps is relieved of its meteorological duties, retain his present military rank and emolument. No element of personal reproach or hostility has entered into the movement for the transfer, so far as we know. The change thus involves no indignity to that gallant and accomplished officer and popular hero. This is a fortunate phase of the matter. And since several of General Greely's most valued assistants either gain promotion in the reorganized branch of military service in which they intend to remain, or else go with the observers and clerks into the new civil bureau, the President will experience less embarrassment than would otherwise be the case in selecting the new Superintendent."

Mr. C. S. Middlemiss, of the Geological Survey of India, now in Hazara, has been appointed geologist with the Black Mountain Expedition.

The *Pioneer* of Allahabad expresses a hope that the opportunity offered by the expedition into the Black Mountain will be utilized for exploring the unknown country lying to the north. Beyond Thakot the very course of the Indus is not certain, and exploration in this direction will be full of interest. It is quite certain that there is no easy passage into Cashmere from the west, or southwards from Banji towards Thakot, but British surveyors must feel it a reproach that the maps should be blank for even 150 miles. The valleys are said to be sparsely populated, and the hills rugged in the extreme; but a party with an energetic leader and a sufficient escort should find no difficulty in making their way up the Indus Valley. There will not on this occasion be any necessity for evacuating the Black Mountain district in a hurried manner, and it would have a good effect along the border if the country northwards to Gilgit were explored.

The South London Entomological and Natural History Society will hold its annual exhibition at the Bridge House Hotel on April 15 and 16. According to the *Entomologist*, there is little doubt that this Exhibition will be "quite equal to, if it does not surpass, any of the Society's previous achievements."

We have to record the publication of a new Italian monthly scientific journal, *Neptunia*, which takes the place of *Notarisia*. It is devoted to "the study of science pure and applied to the sea and to marine organisms." It is edited by Dr. D. Levi-Morrenos, and three numbers have already appeared. Freshwater as well as marine Algæ are also taken under its cognizance; and, in the numbers already published, appear papers on Conjugation in the Zygnemaceæ, and on the Cystocarps and antherids of *Catenella Opuntia*, by our countrymen Mr. W West and Prof. Harvey-Gibson.

The editor of *Neptunia* announces a project for the establishment of a marine station at Sebastopol. The plan followed in the erection will be that of the Zoological Station at Naples, but on a smaller scale. The building will consist of three stories, of which one will be devoted to the aquarium, another to the laboratory, and the third to the library, the museum, and the private rooms of the Director.

The Shanghai papers report that an extensive collection of rare and beautiful butterflies, collected by the late Captain Yankowsky, the commander of a merchant steamer on the China coast, was recently sold by public auction. There was a good attendance and some spirited bidding. But the merchant princes and millionaires of the settlement were conspicuous by their absence, and the labour of a life-time was scattered and sold piecemeal. Strange to say, some of the cases containing butterflies which are not very rare went higher than those from the most distant parts of China, from Omiesan, Wusan, and Tachin-lu in the west of Szechuen. The chief purchasers were Mr. Carl Bock, who was present on behalf of the Shanghai Museum, and Inspector Howard, who bought on his own account. The entire collection fetched only Tls. 262 (about £50).

Perhaps the most important addition that has been made to the interesting collection of animals in the Calcutta Zoological Gardens since its establishment fifteen years ago is the Greater Bird of Paradise (*Paradisea apoda*, Linn.). The committee of management had long been desirous of acquiring a specimen, but owing to the great rarity of the species, and the very great cost of those that are on rare occasions offered for sale, their efforts to procure one had hitherto proved unsuccessful. At last, however, they have succeeded, thanks to the liberality of the Maharajah Bahadur of Dumraon, who is a great patron of the institution.

Mr. Littledale, of Baroda, has made a proposal that the Bombay Natural History Society should carry out certain interesting experiments with a view of ascertaining whether several of the game birds which are common in other parts of the country could be successfully introduced into the neighbourhood of Bombay, such as the chukor, black partridge, and Bengal florican. A special meeting of the Society was convened for the consideration of this proposal, which also includes the possible introduction of several of the African antelopes, and it was unanimously agreed to. Experiments of this character are of the greatest interest to naturalists as well as sportsmen.

A climatological table issued by the German Meteorological Society shows that the mean temperature for the year 1890 ranged from 44°·1 F. at Königsberg to 50°·2 at Aix-la-Chapelle and Cologne, and 50°·4 at Strassburg, the mean for the Empire, deduced from the observations at twenty-five selected stations, being 47°·9. In January the mean ranged from 26°·2 at Königsberg to 35°·8 at Aix-la-Chapelle, the general mean being 31°·1. July had from 63°·1 at Hamburg to 67°·1 at Frankfort-on-the-Maine and Freiburg, the mean for the whole being 65°·2. The rainfall varies between 19·69 inches at Posen to 50 inches at Freiburg, but only four stations have more than 30 inches, and only eleven receive more than 25 inches, the mean amount for the Empire being 26·58 inches. For the sake of comparison we give the following results calculated from the publications of the Meteorological Office. The mean tempera- of the British Isles for the year 1890 was 48°·0, ranging from 45°·7 in the north of Scotland to 51° in the Channel Islands.

January had a mean of 42°·6 (38°·3 at Hawes Junction and 38°·4 at Braemar, to from 46° to 48°·3 at several stations in the south-west of England), and July 56°·9 (from 51°·5 at Sumburgh Head and Glencarron to 60°·9 at Southampton). The two months it will be remembered were exceptional in these islands, the former being unusually mild, and the latter exceptionally cold. Although, therefore, there was practically no difference between the mean temperature of the two countries for the whole year, Germany was 11°·5 colder in January and 8°·3 warmer in July. The rainfall of the United Kingdom was 33·4 inches, the eastern districts of England having from 22 inches to 25·4 inches, and elsewhere from 32·9 inches in the Channel Islands to 52·8 inches in the west of Scotland, and 55·1 inches in the north of Scotland. London was rather more than a degree warmer than Berlin for the year, and nearly 13° warmer in January, the means being, London, January 43°·7, July 60°·4, year 49°·5; Berlin, respectively 31°·1, 66°·2, and 48°·4. The former had 22·78 inches of rain, the latter 23·63 inches.

At the meeting of the Linnean Society of New South Wales on February 25, Mr. R. Etheridge, Jun., in continuation of former notes, read a paper on Australian aboriginal stone weapons and implements. Among the objects he exhibited and described were stone knives from Northern Australia; small and beautifully-formed spear-heads from Kimberley; larger lanceolate spear-heads from Nicholson River and Settlement Creek, North-West Carpentaria; and talismanic stones from New England and North Queensland, the latter a very interesting tael formed of two rock crystals joined by a gum-cement mixed with human hair.

A Royal Commission on Vegetable Products has just been at work in Victoria, and the result has been to bring together a valuable array of facts regarding what is called the "scent farming" industry in that colony. Mr. Shillinglaw, the secretary to the Commission, has just published a *précis* of the proceedings, which is extremely interesting, as conveying some idea of the extent to which the cultivation of perfume plants has been carried in Victoria. The Commissioners during the course of their inquiries, investigated the Dunolly Perfume Farm, and also drew largely from the experiences of Mr. Joseph Bosisto, the originator of the scent farming industry in the Wimmera district. The general result of the inquiry seems to be that the soil and climate of Victoria are particularly well suited for the cultivation of scent-producing plants.

Messrs. B. Westermann and Co., New York, have sent us the first part of what promises to be an important work on "The Fishes of North America that are caught on Hook and Line." The author is Mr. W. C. Harris. The coloured illustrations are executed most carefully.

A "Fauna of Normandy," by M. Henri Gadeau de Kerville, has been in course of publication in Paris since 1888. Two volumes have been issued—"Mammalia" and "Birds." There are no engravings, and the work consists essentially of an enumeration of the animals observed in Normandy, with bibliographical references, and some notes on modes of life, instincts, and general biology.

The fourth volume of the *Internationales Archiv für Ethnographie* opens with a double number of great interest. Dr. Masanao Koike gives an excellent account of the observations made by him during a residence of two years in Corea. This paper, written originally in Japanese, has been translated into German by Dr. Rintaro Mori. A description of the Corean collections in the ethnographical museum of Leyden is contributed by Dr. J. D. E. Schmeltz; and Dr. A. Baessler makes some valuable additions to our knowledge of the ethnography of the East Indian Archipelago. Prof. H. H. Giglioli has an interesting paper on two ancient Peruvian masks made with the facial portion of human skulls. The number, as usual, is admirably illustrated.

Mr. Philip B. Mason has an interesting little note in the new number of the *Zoologist* on a question which has lately been discussed in that periodical—whether squirrels remain active during the coldest weather. Mr. Mason is able to state that during the whole of the recent severe and prolonged frost several squirrels which had been accustomed to climb to the nursery window of Drakelowe Hall, Burton-on-Trent, where they were fed, continued their visits during the whole of the time, and seemed to be as lively as usual.

The first number of a new quarterly magazine for conchologists has been issued. It is called the *Conchologist*, and promises to be of much service to the class of students to whom it is specially addressed. If adequate support is received, the magazine will be issued as a bi-monthly in 1892.

We note the appearance of a new trade journal, the *Optician*. It is intended to act as the organ of the optical, mathematical, philosophical, electrical, and photographic instrument industries, and also to present a review of the jewellery and allied trades.

The Royal University of Ireland has issued its Calendar for the year 1891. We have already noted that the papers set at the examinations in 1890 are published in a separate volume, forming a supplement to this Calendar.

Messrs. Dulau and Co. have issued a catalogue of the botanical works which they now offer for sale.

At the last monthly meeting of the Manchester Geological Society Mr. Tonge read an interesting paper entitled "Coal-Mining in 1850 and 1890: a Few Contrasts." He said that during the forty years from 1850 to 1890 progress had not been more marked in any direction than in the industry of coal-mining. Not only had new fields been discovered which previously were not even suspected, not only had greater depths been reached, but far greater quantities of coal had been raised; and, what was more important, the collier's life had been made more secure and his work more pleasant, whilst his health, mental powers, and moral character had been more carefully studied and protected. In 1851 there were rather more than 50,000,000 tons of coal and other minerals raised; in 1889, 185,187,266 tons. In 1851 there were 216,217 persons employed above and below ground in coal-mining; in 1889, 563,735. In 1851 there were 984 deaths caused by accidents in and about mines, being at the rate of 4·56 persons per 1000 employed; in 1889 there were 1069 deaths, being at the rate of 1·88 per 1000 employed. In 1851 there was one death from accident for every 219 persons employed; in 1889, one for every 530, the degree of safety being two and a half times greater in 1889 than in 1851. He attributed the improved condition of things largely to beneficent legislation, to scientific and mechanical discoveries, bringing improvements in machinery, ventilation, and lighting, and to greater care in the use of explosives. The collier's labour had been considerably lightened. He had not such long distances to waggon his coal; he had not to go to the surface, as in former times, to look for props, and perhaps saw them for himself. The travelling roads and working places were in much better condition; and the system of working, being mostly long-wall, enabled him to get his coal with much greater ease, and to get a greater quantity than by the pillar and stall system which in 1851 was so much practised.

At the meeting of the Société Chimique of February 27, M. Hanriot communicated the fact that he had repeated the work of Messrs. Mond, Langer, and Quincke, an account of which was given in NATURE, vol. xlii. p. 370, upon the remarkable compound of nickel and carbon monoxide, $Ni(CO)_4$. He finds that it is a most highly poisonous substance, far more deadly than carbon monoxide itself. Blood poisoned by means of it exhibits the characteristic absorption-spectrum of blood containing carbon monoxide. The oxygen of the air diminishes somewhat the poisonous action of the compound, owing to the fact that it rapidly promotes dissociation into metallic nickel and carbon monoxide.

THE mineral hornblende has been artificially reproduced in well-formed crystals by M. Kroustchoff, and an account of his experiments is communicated to the current number of the *Comptes rendus*. The last few years have been most fruitful in mineral syntheses, so much so indeed that there remain very few of the more commonly occurring rock-forming minerals which have not been artificially prepared in the laboratory. M. Kroustchoff, who not long ago described a mode of preparing most perfect crystals of quartz, has made many attempts to reproduce hornblende, and has at length succeeded by the adoption of the following somewhat remarkable process. This process essentially consists in digesting together for a long period of time, *in vacuo*, and at a high temperature, the various oxides contained in natural hornblendic amphiboles, in presence of water. Small flasks of green glass were employed, each of which was exhausted by means of a Sprengel pump after the introduction of the substances to be digested together. The ingredients digested consisted of (1) a dialyzed three per cent. aqueous solution of silica; (2) an aqueous solution of alumina obtained by dissolving aluminium hydrate in an aqueous solution of aluminium chloride and subjecting the solution to dialysis; (3) an aqueous solution of ferric oxide obtained by the addition of ammonium carbonate to ferric chloride in such quantity as to redissolve the precipitate first formed, and dialyzing the solution; (4) carefully prepared pure ferrous hydrate; (5) lime water; (6) freshly precipitated hydrate of magnesia; and (7) a few drops of caustic soda and potash. The mixture presented the appearance of a gelatinous mud. The exhausted and sealed flasks were placed in a specially constructed iron many-chambered furnace, and heated for three months to a temperature of 550° C. At the expiration of this time the appearance of the contents had entirely changed, having become much darker in colour, and distributed throughout were numerous brilliant little crystals, almost black in colour, and reminding one forcibly of natural hornblende. On systematic examination they were found to consist of flattened prisms identical in character with hornblende. Under the microscope they exhibited the hornblendic yellowish-green colour and pleochroism. Their index of refraction was the same as that of natural hornblende, about 1·65. The angle between their optic axes was found to be 82°; that of natural crystals varies from 80° to 85°. Analyses gave the characteristic amphibolic percentages, that of SiO_2 being 42·3. In addition to these crystals of hornblende it is interesting to note that pyroxenic crystals resembling those of the augite family were also found in the flasks, together with crystals of a zeolite and of a variety of orthoclase felspar. And finally, some exquisite little quartz crystals were observed, showing cavities containing liquids and bubbles resembling those of natural rock crystals.

THE additions to the Zoological Society's Gardens during the past week include an Arctic Fox (*Canis lagopus*) from Iceland, presented by Mr. H. Sacheverell Bateman; a Squirrel-like Phalanger (*Belideus sciureus* ♂) from North Australia, presented by Mrs. FitzGerald; a Lacertine Snake (*Cœlopeltis lacertina*), South European, presented by Mr. J. C. Warburg; a Rhesus Monkey (*Macacus rhesus* ♂) from India; a Common Wolf (*Canis lupus* ♀), European, deposited; two Violaceous Plantain Cutters (*Musophaga violacea*) from West Africa, four Cape Colys (*Colius capensis*) from South Africa, a Carpet Snake (*Morelia variegata*) from Australia, purchased; a Collared Fruit Bat (*Cynonycteris collaris*), a Vulpine Phalanger (*Phalangista vulpina* ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

STARS HAVING PECULIAR SPECTRA.—*Astronomische Nachrichten*, No. 3025, contains a note entitled "A Fifth Type of Stellar Spectra," by Prof. E. C. Pickering, and one by Mrs. Fleming, in which she describes the following objects of interest, discovered during an examination of the photographs of stellar spectra taken at Harvard College Observatory with the 8-inch Draper telescope:—

Designation.	R.A. 1900.	Decl. 1900.	Mag.	Description of spectrum
	h. m.	°		
D.M. + 63°·83 ...	0 37·5	+64 14	9·5	Bright lines.
Cord. G.C. 23416	17 12·1	−45 32	7·2	,, ,,
[Aquarius]	20 41·2	− 4 26	Var.	III. Type; G and *h* bright.
[Delphinus].........	20 43·1	+18 58	Var.	,, ,, ,,

The similarity of the spectra of the two stars in Aquarius and in Delphinus to that commonly shown by variables of long period led Mrs. Fleming to suspect the variability, which was confirmed by an examination of photographs taken on various dates. With respect to this point, Prof. Pickering remarks, in the note to which reference has already been made:—"Probably most of the variable stars of long period give a spectrum resembling that of *o* Ceti, and having the hydrogen lines G, *h*, α, β, γ, and δ bright about the time of maximum. When the photographic spectrum is faint, only the brighter lines G and *h* are visible. Photographs have been obtained of forty-one of these objects, ten of which have been discovered by means of this peculiarity of their spectrum."

Following the classification suggested by Prof. Lockyer in the Bakerian lecture for 1888, spectra of Secchi's third type are divided into sub-groups, of which α Orionis, α Herculis, S.D. − 2°·3653, and *o* Ceti, are given as examples.

The fifth type of stellar spectra which Prof. Pickering proposes to establish will contain planetary nebulæ and bright-line stars, and is therefore equivalent to Lockyer's Group I. Photographs of the spectra of sixteen planetary nebulæ taken at Harvard resemble each other closely, and consist mainly of bright lines and bands. The bright-line stars are divided into three classes, in the first and second of which λ 469 is the most conspicuous line, whilst the third class is distinguished by the distinctness of a line at λ 464. A comparison shows that the position of the lines of these stars and planetary nebulæ is the same as in Orion stars, but the lines are dark instead of bright in the last-named bodies. Only a three-figure reference is now given to the positions of the lines, and more precise measures of wave-length will be required to show whether the slight differences which exist are real or not. The irregular distribution of these objects in the heavens is another point of resemblance. Four-fifths of the stars of the Orion type are found in the Milky Way. A similar distribution of the planetary nebulæ has long been recognized. By arranging thirty-three bright-line stars according to their distances from the pole of the Milky Way (R.A. 12h. 40m., Decl. + 28°), and its ascending node (R.A. 18h. 40m., Decl. 0°), Prof. Pickering shows that their distribution is also strikingly irregular. The average value of the galactic latitude of all the stars is 2° 6′. Groups occur in Argo, Scorpio, and Cygnus. The approximate longitudes are 257°, 313°, and 42°. The number of stars in these groups is 7, 5, and 8, or 20 in all. Each group is included in a circle 8° in diameter, and of all the members only three are isolated, being distant 10° or more from any of the others. It therefore follows that one half of the known bright-line stars are included in an area of about one three-hundredth of the entire sky. It is gratifying to find the suggestion, that stars with bright lines are physically similar to planetary nebulæ, supported by the numerous observations made at Harvard College Observatory. The anomalous character of the spectra of the Orion stars has long been a matter of discussion. Perhaps the agreement as to position of the dark lines in these stars with the bright lines in others will enable their place in stellar evolution to be determined.